Name:

at1121exam_practice: Radicals and Squares (v615)

Question 1

Simplify the radical expressions.

$\sqrt{75}$	$\sqrt{98}$	$\sqrt{8}$
$\sqrt{5 \cdot 5 \cdot 3}$	$\sqrt{7 \cdot 7 \cdot 2}$	$\sqrt{2 \cdot 2 \cdot 2}$
$5\sqrt{3}$	$7\sqrt{2}$	$2\sqrt{2}$

Question 2

Find all solutions to the equation below:

$$8\left((x-7)^2-10\right) \;=\; 48$$

First, divide both sides by 8.

$$(x-7)^2-10=6$$

Then, add 10 to both sides.

$$(x-7)^2=16$$

Undo the squaring. Remember the plus-minus symbol.

$$x-7=\pm 4$$

Add 7 to both sides.

$$x=7\pm 4$$

So the two solutions are $x=11$ and $x=3$.

Question 3

By completing the square, find both solutions to the given equation. *You must show work for full credit!*

$$x^2 - 16x = 80$$

$$x^2 - 16x + 64 = 80 + 64$$
$$x^2 - 16x + 64 = 144$$
$$(x-8)^2 = 144$$
$$x - 8 = \pm 12$$
$$x = 8 \pm 12$$
$$x = 20 \quad \text{or} \quad x = -4$$

Question 4

A quadratic polynomial function is shown below in standard form.

$$y = 3x^2 - 24x + 42$$

Express the function in **vertex form** and identify the **location** of the vertex.

From the first two terms, factor out 3 .

$$y = 3(x^2 - 8x) + 42$$

We want a perfect square. Halve -8 and square the result to get 16 . Add and subtract that value inside the parentheses.

$$y = 3(x^2 - 8x + 16 - 16) + 42$$

Factor the perfect-square trinomial.

$$y = 3((x-4)^2 - 16) + 42$$

Distribute the 3.

$$y = 3(x-4)^2 - 48 + 42$$

Combine the constants to get **vertex form**:

$$y = 3(x-4)^2 - 6$$

The vertex is at point $(4, -6)$.